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Dixon

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[54] THREE CELL WIRELESS COMMUNICATION SYSTEM

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 [*] Notice: The term of this patent shall not extend beyond the expiration date of Pat. No. 5,402,413.

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Related U.S. Application Data

- [63] Continuation of Ser. No. 410,901, Mar. 27, 1995, Pat. No. 5,640,674; Continuation-in-part of Ser. No. 652,030, Apr. 8, 1991, Pat. No. 5,402,413.
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 [58] Field of Search 455/422, 432, 455/436, 443, 517, 524; 375/200; 370/335; 337

[56] References Cited

U.S. PATENT DOCUMENTS

- Re. 27,738 8/1973 Honna et al.
 3,934,203 1/1976 Schiff.
 3,978,436 8/1976 Alig et al.
 4,021,898 5/1977 Willis et al.
 4,051,448 9/1977 Cousoul.
 4,100,498 7/1978 Alsup et al.

(List continued on next page.)

FOREIGN PATENT DOCUMENTS

- 39,944/85 9/1985 Australia H04B 7/26
 0150399 8/1985 European Pat. Off. H04Q 7/04
 0156335 10/1985 European Pat. Off. H04Q 7/04
 0189695 6/1986 European Pat. Off. H04B 7/26
 01114222 5/1989 Japan H04B 7/06

9315573 &1993 WIPO H04J 13/00

OTHER PUBLICATIONS

- Dixon, Robert C., *Spread Spectrum Systems*, (J. Wiley & Sons, 2d ed. 1984), pp. 1-422.
 Eschenbach, Ralph, "Applications of Spread Spectrum Radio to Indoor Data Communications," *Proceedings of the IEEE*, pp. 34.5-1-34.5-3, 1982.
 Feret, Payne, et al., "Applications of Spread-Spectrum Radio to Wireless Terminal Communications", *Proceedings of the IEEE*, pp. 69.7.1-69.7.4, 1980.
 Feret, Payne, et al., "Wireless Terminal Communications Using Spread-Spectrum Radio", *Proceedings of the IEEE*, 244-248, 1980.

Kavehrad, M., et al., "Performance of Low-Complexity Channel Coding and Diversity for Spread Spectrum in Indoor, Wireless Communication", *AT&T Tech. Journal*, vol. 64, No. 8, pp. 1927-1965, Oct. 1985.

Kavehrad, M., et al., "Spread Spectrum for Indoor Digital Radio", *IEEE Communication Magazine*, vol. 25, No. 6, pp. 32-40, Jun. 1987.

(List continued on next page.)

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[57] ABSTRACT

A wireless communication system including a repeated pattern of cells, in which base station transmitters and user station transmitters for each cell may be assigned a spread-spectrum code for modulating radio signal communication in that cell. Radio signals used in that cell are spread across a bandwidth sufficiently wide that both base station receivers and user station receivers in an adjacent cell may distinguish communication which originates in one cell from another. Adjacent cells may use distinguishable frequencies and distinguishable codes, but it is sufficient if adjacent cells use distinguishable frequencies and identical codes. A repeated pattern of cells allows the codes each to be reused in a plurality of cells.

20 Claims, 2 Drawing Sheets

